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FOREST INSECT AND DISEASE CONDITIONS

1985

Pacific Northwest Region

The spruce budworm and mountain pine beetle continued to account for most of the insect-infested acreage reported in the Pacific Northwest Region.

The western spruce budworm-defoliated areas covered about 5 million acres. This acreage includes the 40,000 acres receiving insecticidal treatments in 1985.

Mountain pine beetle-caused tree killing increased with about 1.4 million acres infested. The majority of the loss, 1 million acres, occurred in the lodgepole pine stands in south-central Oregon.

Root diseases are among the most serious pests in Pacific Northwest forests because of the magnitude of losses and difficulty of treatment. Annual timber volume losses due to root diseases are estimated at 130 million cubic feet in Oregon and Washington.

Dwarf mistletoes continue to cause large timber losses, although they are steadily declining. Annual losses are estimated at 133 million cubic feet.

Good progress is being made to hazard rate sites for white pine blister rust infection and damage potential.

FOREST INSECT AND DISEASE CONDITIONS
1985
PACIFIC NORTHWEST REGION

DISEASE	HOST	LOCATION	REMARKS
Dwarf Mistletoes *Arceuthobium* spp.	Various conifers	Oregon, Washington	As stand management intensifies, losses due to this group of disease-causing organisms are declining. Dwarf mistletoes caused an estimated loss of 132.7 million cubic feet of timber in Oregon and Washington in 1985. Programs for handheld programmable calculators are being used to project reductions in yield and perform economic analyses for dwarf mistletoe-infected central Oregon lodgepole pine.
Stem Decay	Various conifers	Oregon, Washington	Stem decay fungi still consume enormous volumes of wood, with the majority of losses occurring in younger stands as wounding of residual trees during stand entries both activates dormant infections and creates excellent infection courts. Programs for handheld calculators have been developed to estimate percentages of infection and decay in white and grand fir understories, two of the most defective species in the Region.
White Pine Blister Rust *Cronartium ribicola*	Western white pine, sugar pine	Oregon, Washington	Annual losses of western white and sugar pines from blister rust in Oregon and Washington are estimated to be 15 million cubic feet. Additional training and follow-up on use of handheld programmable calculator programs for predicting infection hazard occurred during 1985.
Annosus Root and Butt Rot *Fomes annosus*	White fir, western hemlock	Oregon, Washington	Annosus root disease is responsible for extensive losses in many partial-cut white fir stands in southern and eastern Oregon. Most loss is due to outright tree mortality. Evidence points to extensive infection throughout eastern Oregon and Washington. Losses in western hemlock stands can be minimized by short (100 year) rotations and wound prevention.

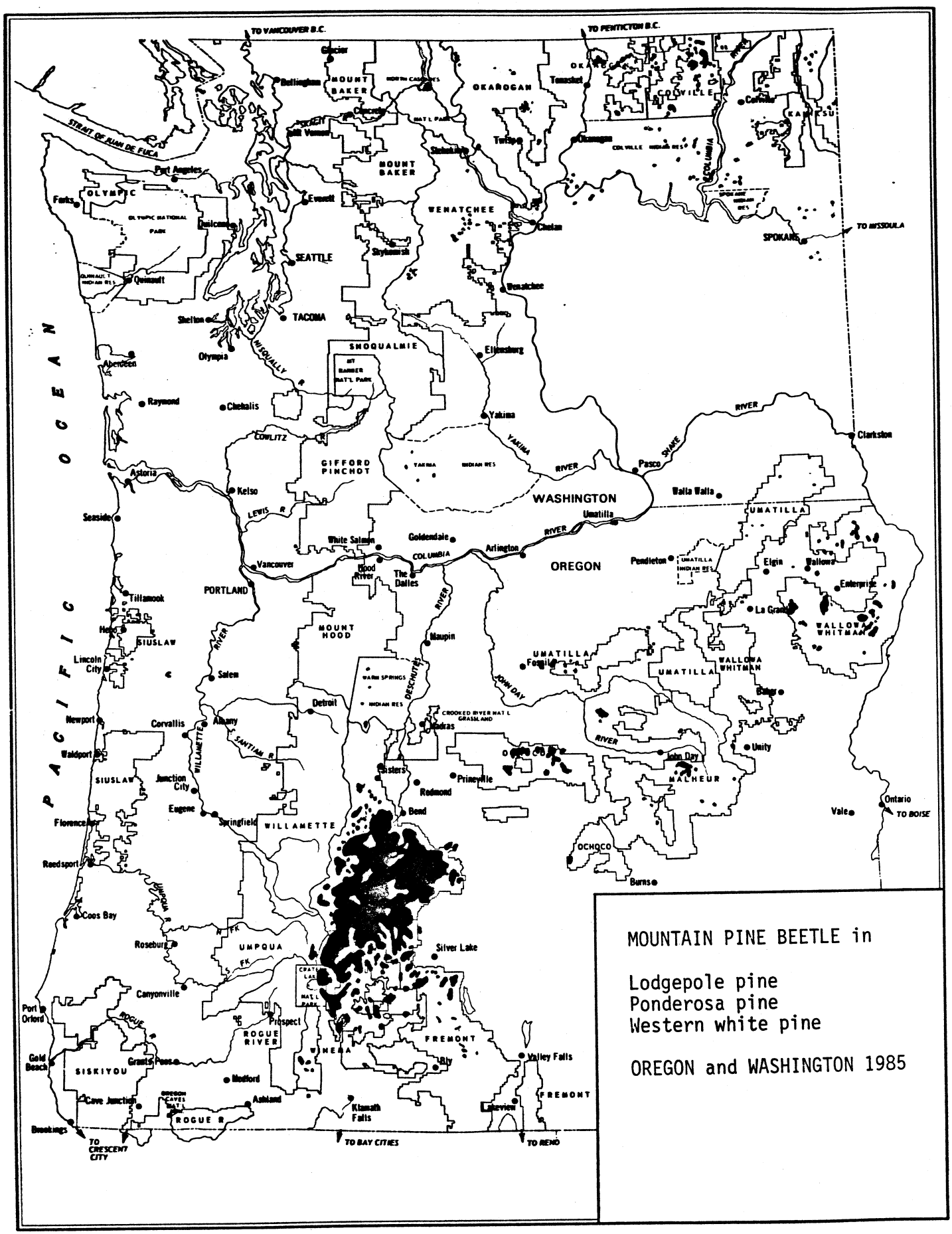
Armillaria Root Disease *Armillaria ostoyae* (= mellea)	Various conifers	Oregon and Washington forests	The most serious losses to this disease occur on the East Side. Serious losses on the West Side are usually confined to stressed stands; for example, off-site plantings. Direct control through stump and root removal is being practiced in severely infected eastern Washington stands.
Black Stain Root Disease *Ceratocystis wageneri*	Douglas-fir	Oregon, Washington	In southwestern Oregon, this is by far the most commonly encountered disease in Douglas-fir plantations. It appears to be especially damaging where disturbances have occurred, especially in roadside Douglas-firs cut back by mechanical choppers. Losses are also greater on tractor-logged versus cable-logged sites due to soil compaction.
Fusarium Root and Hypocotyl Rots *Fusarium oxysporum*	Various conifer seedlings	Oregon, Washington forest nurseries	Scattered losses for most species; continued heavy mortality for sugar pine.
Laminated Root Rot *Phellinus weirii*	Douglas-fir, grand fir, white fir	Oregon and Washington forests	Laminated root rot is estimated to have removed about 5 percent of the West Side Douglas-fir type from full production. The acreage of infestation may be closer to 10 percent. Damage is also severe in some grand and white fir stands with true fir overstory.
Phytophthora Root Rot *Phytophthora* sp.	Douglas-fir and other conifer seedlings	Oregon, Washington forest nurseries	Disease severity was lower in 1985 due to unusually dry weather throughout the summer, fall, and winter. Seedbed seedling damage is confined primarily to low, poorly drained areas of nursery beds.
Port-Orford-Cedar Root Rot *Phytophthora lateralis*	Port-Orford-cedar	Southwestern Oregon	Port-Orford-cedar root disease continues to cause widespread mortality of Port-Orford-cedar in southwestern Oregon.
Root Disease	Various conifers	Oregon, Washington	Root diseases are among the most serious pest problems in Oregon and Washington forests. The incidence of root disease is increasing, often in direct response to human activity. Annual losses to root diseases on all ownerships are estimated at about 130 million cubic feet.

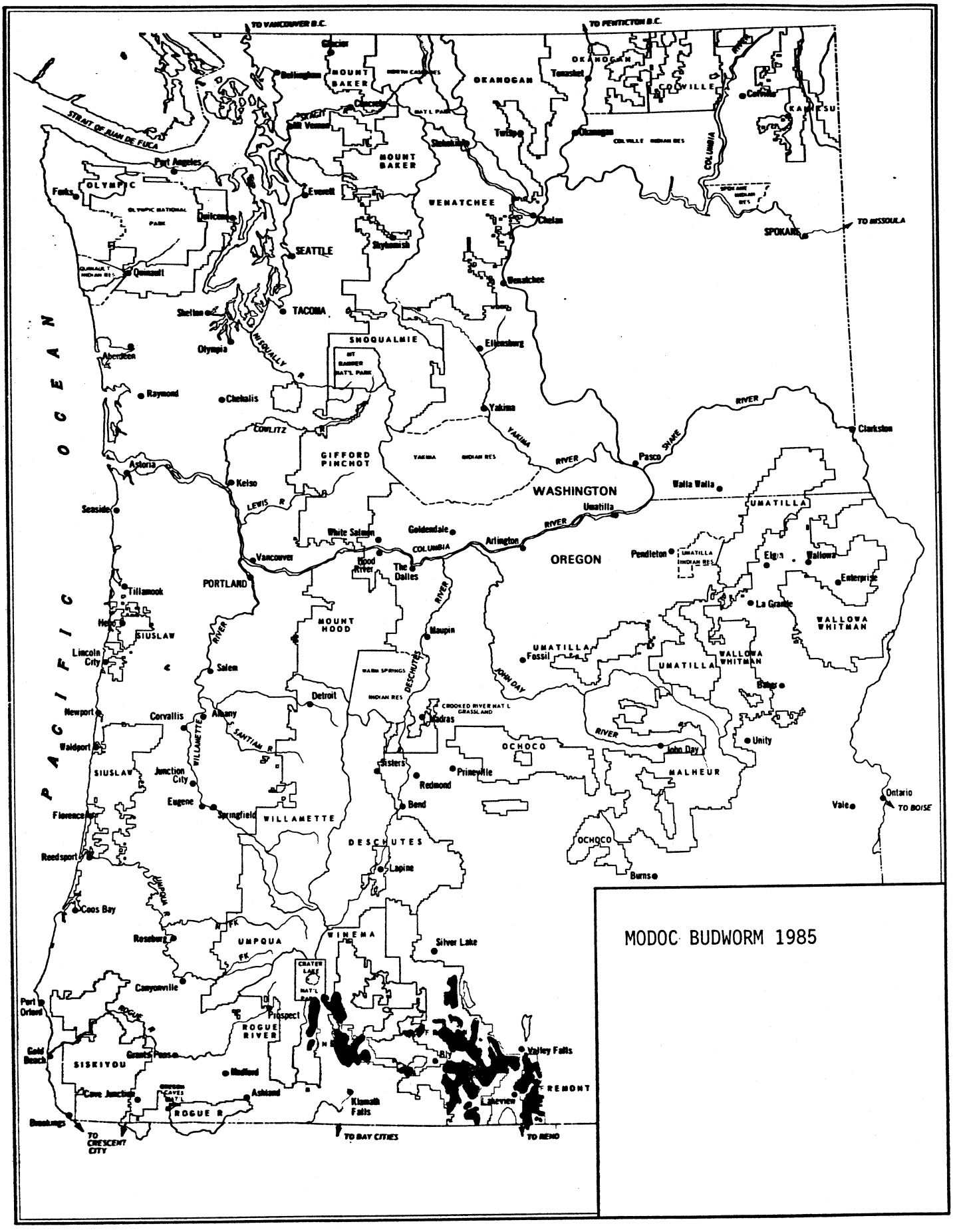
Foliage Disease *Dothistroma pini* *Elytroderma deformas* *Rhabdocline pseudotsugae*	Lodgepole pine, Ponderosa pine, Douglas-fir	Oregon and Washington forests	The incidence of several foliage diseases was reduced in 1985 compared to 1984.
Douglas-fir Canker Diseases *Phoma eupyrena* *Fusarium roseum* *Botytis cinerea* *Phomopsis* spp.	Douglas-fir seedlings	Oregon, Washington forest nurseries	Damage is scattered with less than 1 percent of crop affected in most nurseries. Fungicide applications are helpful when cankers are above ground and not covered with soil collar.
Meria Needle Cast *Meria laricis*	Western larch seedlings	Washington forest nurseries	Very little infection or defoliation seen in 1985 due to dry weather and fungicide treatments.

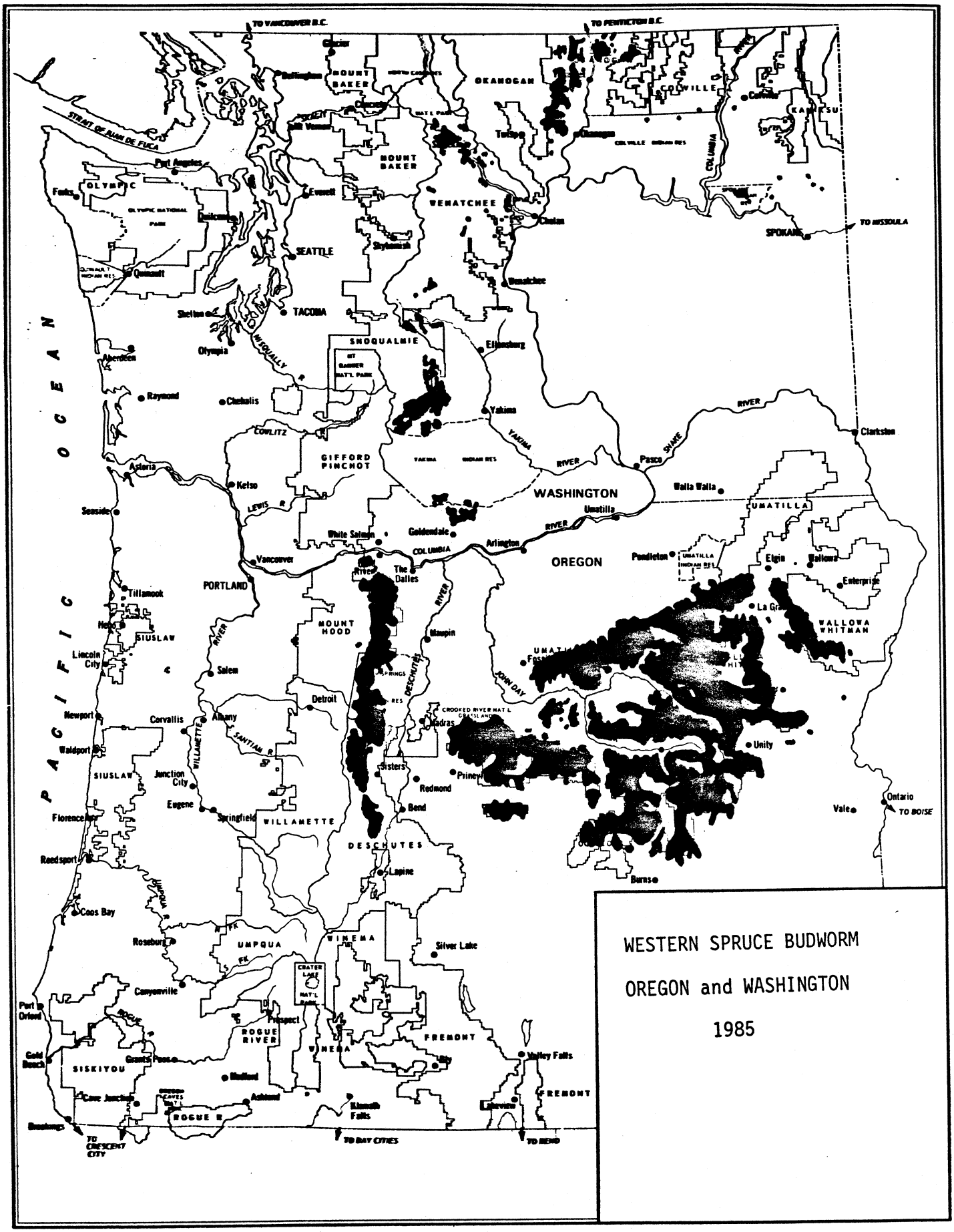
INSECT	HOST	LOCATION	REMARKS
Douglas-fir Beetle *Dendroctonus pseudotsugae* Hopk.	Douglas-fir	Washington, Oregon	Douglas-fir beetle damage was up from 1984 east of the Cascade Range. Losses in Douglas-fir were 10,670 acres (245.73 MCF) east of the Cascades. Current damage levels are still far below what they were in the 1970's. The greatest damage in 1985 was on the Wallowa-Whitman National Forest in the Snake River NRA area. West of the Cascades losses decreased significantly. Damage was reported on 17,720 acres (1151.27 MCF) in 1985 as compared to 5,120 acres (90 MCF) in 1984.
Douglas-fir Bud Moth *Zeirophera hesperiana* Mutuura and Freeman	Douglas-fir	Oregon	Light to heavy defoliation was reported on 99,860 acres of mature Douglas-fir. Most of the defoliation was on the Siuslaw National Forest and adjoining State, private, and Bureau of Land Management lands. Smaller areas of defoliation occurred on the Willamette National Forest. This is the first reported defoliation caused by this insect since the mid 1960's.
Fir engraver *Scolytus ventralis* (Lec.)	True fir	Washington, Oregon	A substantial increase in fir engraver activity was noted in Oregon and Washington. Most of the fir engraver damage occurred on sites infected with either laminated root rot (*Phellinus weirii*, Armillaria root rot (*Armillaria mellea*), or annosus root rot (*Fomes annosus*), which weaken true firs, making them susceptible to beetle attacks. Total losses were 11,470 acres (198.02 MCF) as compared to 4,080 acres (79.5 MCF) in 1984.

Gypsy Moth *Lymantria dispar* (L.)	Various hardwoods and conifers	Washington and Oregon	Adult trap catches increased in Washington from 161 in 1984 to 175 in 1985. An Eradication project was conducted in Bellingham, Washington, utilizing the inherited sterility technique. In Oregon, adult trap catches were over 19,000 in 1984 and 1,537 in 1985. An eradication project using *B.t.* was conducted in Lane County on 227,000 acres. A 200,000-acre eradication project is proposed for 1986.
Modoc Budworm *Choristoneura retiniana* (Wlsm.)	Douglas-fir true fir	Southern Oregon	Modoc budworm defoliation increased in southern Oregon in true fir stands on the Fremont and Winema National Forests. Total acres of visible defoliation increased from 493,630 in 1984 to 503,400 in 1985. Results of the fall 1985 egg mass survey indicate continued defoliation in 1986.
Mountain Pine Beetle *Dendroctonus ponderosae* Hopk.	Lodgepole, ponderosa, white pine, and other pines	Washington, Oregon	Losses continued at about the same level in Washington, but have intensified from 1984 on the Deschutes, Fremont, and Winema NF's in Oregon. The Wallowa-Whitman, Malheur, and Umatilla NF losses continue to decrease, primarily due to most suitable host trees having already been killed. The 1985 MPB losses include 1,339,220 acres (49,584.73 MCF) of lodgepole pine, 188,000 acres (3,831.60 MCF) of ponderosa pine, 19,930 acres (814.35 MCF) of western white pine, and about 680 acres of various other pines. Intense losses are expected to continue in south central Oregon and north central Washington and decrease in the rest of the Region.
Pine Engraver *Ips* spp.	Ponderosa pine	Washington, Oregon	Activity of the pine engraver increased significantly from 1984. Total infested acres was 2,720. Most of the activity was on the Ochoco National Forest.
Spruce Beetle *Dendroctonus rufipennis* (Kirby)	Engelmann spruce	Washington, Oregon	Spruce beetle activity in Engelmann spruce stands in Oregon and Washington was very low this year. Losses include 1,500 acres (18.3 MCF). A major outbreak is developing on the Wallowa-Whitman National Forest near Halfway, Oregon.
Western Pine Beetle *Dendroctonus brevicomis* (Lec.)	Ponderosa pine	Washington, Oregon	Tree mortality, caused by the western pine beetle, increased in Washington and Oregon from 780.6 MCF in 1984 to 4,893.85 MCF in 1985. Greatest losses occurred on the Deschutes National Forest.

Western Spruce Budworm *Choristoneura occidentalis* (Freeman)	Douglas-fir, true fir, western larch and Engelmann spruce	Washington, Oregon	In the Pacific Northwest Region, the area of visible defoliation caused by western spruce budworm increased from 3,096,650 acres in 1984 to 4,982,680 acres in 1985. Budworm continues to increase in Oregon on the Malheur, Wallowa-Whitman, Mt. Hood, Deschutes, Ochoco, and Umatilla National Forests, Warm Springs Indian Reservation, and intermingled State and private lands. In Washington, the size of the budworm infestation on the Okanogan National Forest and adjacent State and private lands increased in 1985. Defoliation discovered on the Wenatchee National Forest in 1984 expanded in 1985. Results of the fall 1985 egg mass survey indicate continued defoliation in 1986. In 1985, 40,000 acres were treated in an operational evaluation of two brands of *Bacillus thuringiensis* (*B.t.*) applied at two different rates on the Malheur NF. An environmental analysis of the budworm infestation is being made to evaluate the current situation.


MOUNTAIN PINE BEETLE in
Lodgepole pine
Ponderosa pine
Western white pine
OREGON and WASHINGTON 1985
PACIFIC OCEAN
WASHINGTON
OREGON
TO VANCOUVER B.C.
TO PENTICTON B.C.
TO MISSOULA
TO BOISE
TO BAY CITIES
TO REND
TO CRESCENT CITY
STRAIT OF JUAN DE FUCA
COLUMBIA RIVER
SNAKE RIVER
YAKIMA RIVER
UMATILLA RIVER
JOHN DAY RIVER
DESCHUTES RIVER
WILLAMETTE R
LEWIS R
ROGUE R
UMPQUA R
SIUSLAW R
SANTIAM R
MOUNT BAKER
OKANOGAN
WENATCHEE
SNOQUALMIE
GIFFORD PINCHOT
MOUNT HOOD
WILLAMETTE
UMPQUA
ROGUE RIVER
SISKIYOU
FREMONT
WINEMA
MALHEUR
UMATILLA
WALLOWA WHITMAN
OCHOCO
COLVILLE
KAIBAB
SEATTLE
TACOMA
PORTLAND
Bellingham
Port Angeles
Forks
Quillayute
Aberdeen
Raymond
Chehalis
Olympia
Shelton
Everett
Skykomish
Wenatchee
Chelan
Omak
Tonasket
Okanogan
Colville
Spokane
Clarkston
Pasco
Walla Walla
Umatilla
Pendleton
Elgin
Wallowa
Enterprise
La Grande
Baker
Unity
John Day
Prineville
Redmond
Bend
Sisters
Madras
Maupin
The Dalles
Hood River
Vancouver
Arlington
Goldendale
White Salmon
Ellensburg
Yakima
Kelso
Astoria
Seaside
Tillamook
Lincoln City
Newport
Waldport
Corvallis
Albany
Salem
Detroit
Junction City
Eugene
Springfield
Florence
Reedsport
Coos Bay
Roseburg
Canyonville
Port Orford
Gold Beach
Grants Pass
Medford
Ashland
Cave Junction
Brookings
Prospect
Klamath Falls
Lakeview
Silver Lake
Valley Falls
Bly
Burns
Vale
Ontario
Fossil
Condon
Dufur
Hood River
Warm Springs Indian Res
Yakima Indian Res
Umatilla Indian Res
Colville Indian Res
Crooked River Natl Grassland
Crater Lake Natl Park
Oregon Caves Natl Mon
Olympic National Park
Mt Rainier Natl Park
North Cascades
Glacier Peak
Columbia Wildlife Refuge
Quinault Indian Res


MODOC BUDWORM 1985
TO VANCOUVER B.C.
TO PENTICTON B.C.
PACIFIC OCEAN
STRAIT OF JUAN DE FUCA
Port Angeles
Forks
OLYMPIC
OLYMPIC NATIONAL PARK
Quillayute
Queets
Quinault
Aberdeen
Hoquiam
Raymond
Chehalis
Olympia
Shelton
TACOMA
SEATTLE
Everett
Bellingham
Glacier
MOUNT BAKER
Concrete
Skykomish
Stehekin
Twisp
Tonasket
OKANOGAN
COLVILLE
Colville
KAMIAK
Okanogan
COLUMBIA
WENATCHEE
Chelan
Wenatchee
Ellensburg
SNOQUALMIE
SPOKANE
TO MISSOULA
YAKIMA
Yakima
Pasco
SNAKE
Clarkston
Walla Walla
WASHINGTON
Umatilla
UMATILLA
Pendleton
Elgin
Wallowa
Enterprise
La Grande
WALLOWA WHITMAN
OREGON
Astoria
Seaside
Kelso
LEWIS R
COWLITZ
GIFFORD PINCHOT
White Salmon
Goldendale
Arlington
COLUMBIA
Vancouver
Hood River
The Dalles
PORTLAND
Tillamook
Neah
SIUSLAW
Lincoln City
Salem
MOUNT HOOD
Maupin
DESCHUTES
WARM SPRINGS INDIAN RES
Fossil
JOHN DAY
Baker
Unity
John Day
OCHOCO
MALHEUR
Ontario
TO BOISE
Vale
Burns
Newport
Waldport
Corvallis
Albany
WILLAMETTE
SANTIAM R
Detroit
Madras
CROOKED RIVER NAT'L GRASSLAND
Sisters
Prineville
Redmond
Bend
Junction City
Eugene
Springfield
Florence
Reedsport
Lapine
Coos Bay
UMPQUA
Roseburg
WINEMA
Silver Lake
Canyonville
CRATER LAKE NAT'L PARK
Port Orford
ROGUE
Prospect
ROGUE RIVER
Gold Beach
Grants Pass
SISKIYOU
Medford
Valley Falls
FREMONT
Cave Junction
OREGON CAVES NAT'L MONUMENT
Ashland
Klamath Falls
Lakeview
ROGUE R
Brookings
TO CRESCENT CITY
TO BAY CITIES
TO BEND


TO VANCOUVER B.C.
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WESTERN SPRUCE BUDWORM
OREGON and WASHINGTON
1985